

WHAT IS CLAIMED IS:

1 1. A pharmaceutical composition for treating a disease associated with
2 one or more self-molecules present non-physiologically in a subject, the composition
3 comprising:

4 (a) an immune modulatory nucleic acid comprising a hexamer region of the
5 formula 5'-Purine-Pyrimidine-[X]-[Y]-Pyrimidine-Pyrimidine-3', wherein X and Y are any
6 naturally occurring or synthetic nucleotides except that X and Y cannot be cytosine-guanine;
7 and

8 (b) a pharmaceutically acceptable carrier.

1 2. The composition of claim 1, wherein the immune modulatory nucleic
2 acid further comprises a polyG region linked 5' or 3' to the hexamer region.

1 3. The composition of claim 1, wherein the immune modulatory nucleic
2 acid further comprises a first polyG region linked 5' to the hexamer region and a second
3 polyG region linked 3' to the hexamer region.

1 4. The composition of claim 1, wherein the immune modulatory nucleic
2 acid is in a sterile vial.

1 5. The composition of claim 1, wherein the immune modulatory nucleic
2 acid is less than about 45 nucleotides in length.

1 6. The composition of claim 1, wherein the immune modulatory nucleic
2 acid further comprises a polynucleotide region encoding self-protein(s), -polypeptide(s) or -
3 peptide(s).

1 7. An nucleic acid composition comprising:
2 a nucleic acid vector having at least one cytosine to non-cytosine substitution
3 within a CpG motif, wherein the CpG motif is of the formula 5'-purine-pyrimidine-C-G-
4 pyrimidine-pyrimidine-3' or 5'-purine-purine-C-G-pyrimidine-pyrimidine-3', and wherein the
5 cytosine to non-cytosine substitution is within the CpG dinucleotide.

1 8. The nucleic acid composition of claim 7, wherein the CpG motif is of
2 the formula 5'-purine-pyrimidine-C-G-pyrimidine-pyrimidine-3'.

1 9. The composition of claim 7, wherein the cytosine to non-cytosine
2 substitution is cytosine to guanine.

1 10. The composition of claim 7, wherein the nucleic acid vector has a
2 plurality of cytosine to non-cytosine substitutions.

1 11. A method for treating a disease in a subject associated with one or
2 more self-molecules present non-physiologically in the subject, the method comprising:
3 administering to the subject an immune modulatory nucleic acid comprising a
4 hexamer region of the formula 5'-Purine-Pyrimidine-[X]-[Y]-Pyrimidine-Pyrimidine-3',
5 wherein X and Y are any naturally occurring or synthetic nucleotides except that X and Y
6 cannot be cytosine-guanine.

1 12. The method of claim 11, wherein the immune modulatory nucleic acid
2 further comprises a polyG region linked 5' or 3' to the hexamer region.

1 13. The method of claim 11, wherein the immune modulatory nucleic acid
2 further comprises a first polyG region linked 5' to the hexamer region and a second polyG
3 region linked 3' to the hexamer region.

1 14. The method of claim 11, wherein the disease is an autoimmune
2 disease.

1 15. The method of claim 14, wherein the disease is multiple sclerosis.

1 16. The method of claim 14, wherein the disease is rheumatoid arthritis.

1 17. The method of claim 14, wherein the disease is insulin dependent
2 diabetes mellitus.

1 18. A method for treating a disease in a subject associated with one or
2 more self-molecules present non-physiologically in the subject, the method comprising:
3 administering to the subject an immune modulatory nucleic acid comprising a
4 hexamer region of the formula 5'-Purine-Purine-[X]-[Y]-Pyrimidine-Pyrimidine-3'; wherein X
5 and Y are any naturally occurring or synthetic nucleotides except that X and Y cannot be
6 cytosine-guanine.

- 1 19. The method of claim 18, wherein the immune modulatory nucleic acid
2 further comprises a polyG region linked 5' or 3' to the hexamer region.
- 1 20. The method of claim 18, wherein the immune modulatory nucleic acid
2 further comprises a first polyG region linked 5' to the hexamer region and a second polyG
3 region linked 3' to the hexamer region.
- 1 21. The method of claim 18, wherein the disease is an autoimmune
2 disease.
- 1 22. The method of claim 21, wherein the disease is multiple sclerosis.
- 1 23. The method of claim 21, wherein the disease is rheumatoid arthritis.
- 1 24. The method of claim 21, wherein the disease is insulin dependent
2 diabetes mellitus.